PREVIOUS QUESTIONS PAPERS
DU. MS.C MICROBIOLGY (2018)

1. Sanger's method of sequencing is:
   (a) Sequencing by chain synthesis
   (b) Sequencing by chain cleavage
   (c) Sequencing by chain termination
   (d) Sequencing by chain ligation

2. What is the hydrogen ion concentration in moles/L, if pH of a solution is 3.0?
   (a) 1×10^{-3} (b) 4×10^{-3} (c) 3×10^{-3} (d) 3

3. A taxonomic system which takes into consideration a large number of phenotypic and genotypic characteristics of the organism is called:
   (a) Numerical taxonomy
   (b) Molecular taxonomy
   (c) Phylogenetics
   (d) Phylogenomics

4. The cytokine which is most commonly used for proliferation of bone marrow cells in vitro:
   (a) TGF-β (b) GM-CSF (c) IFN-γ (d) IL-2

5. The interaction of two proteins within a cell can be visualized by:
   (a) All of the above
   (b) Biomolecules with fluorescence complementation
   (c) Fluorescence recovery effectively transferred
   (d) Fluorescence resonance energy transfer

6. The arrangement in which flagella are distributed all around the bacterial cell is known as:
   (a) Amphitrichous (b) Peritrichous (c) Monotrichous (d) Lophotrichous

7. The dried female flowers of Humulus lupulus are used in the production of:
   (a) Wine (b) Bread (c) Beer (d) Tofu

8. The Swiss cheese ripening process is done using:
   (a) Geotrichium candidum
   (b) Penicillium roqueforti
   (c) Penicillium camemberti
   (d) Propionibacterium sp.

9. The culture media containing heat labile constituents are best sterilized by:
   (a) UV-irradiation
   (b) Filtration using membrane filter
   (c) Dry heat at 180oC for 30 min
   (d) Autoclaving at 15 psi for 30 min

10. The koji for miso is a culture of:
    (a) Aspergillus oryzae
    (b) Aspergillus lentulus
    (c) Aspergillus flavus
    (d) Aspergillus fumigatus

11. Klinefelter syndrome is characterized by:
    (a) chromosome 19 trisomy
    (b) chromosome 21 monosomy
    (c) one or more extra X chromosomes
    (d) fragile X chromosome

12. Peptidoglycan is also known as:
    (a) N-acetyl glucosamine (b) N-acetyl muramic acid
    (c) Murein mucopeptide (d) Mesodiaminopimelic acid
13. All of the following are sporicidal except:
    (a) Formaldehyde (b) Glutaraldehyde (c) Ethylene oxide (d) Alcohol
14. The time required to kill 90% of the micro-organisms in a sample at a specific temperature is the
    (a) Decimal reduction time (b) Log reduction
    (c) Thermal inactivation constant (d) Thermal death point
15. The new antigens which appear on the tumors produced by irradiation are called:
    (a) Tumor-specific transplantation antigens (TSTA) (b) Carcino-embryonic antigens
    (c) Tumor associated antigens (TAA) (d) Tumor infiltrating antigens
16. Thermoduric bacteria are majorly found in:
    (a) Pasteurized milk and dried milk (b) Ice-creams
    (c) None of the these (d) Vegetables
17. The phenomenon in which the severity of symptoms in genetic disorders increases from generation to generation is called:
    (a) Genetic drift (b) Genetic anticipation
    (c) Genetic polymorphism (d) Genetic erosion
18. Deviation in Hardy-Weinberg equilibrium in a population would be caused by
    (a) Small population size (b) Lack of mutation
    (c) Lack of selection (d) Random mating
19. If the specific growth rate of the microorganism is 0.25 h-1, find out it's doubling time?
    (a) 1.77 h (b) 2.77 h (c) 4.77 h (d) 3.77 h
20. A polymerase that extends DNA chains in template-independent manner is:
    (a) Klenow (b) DNA pol I
    (c) Terminal deoxynucleotidyl transferase (d) Pfu DNA polymerase
21. The Pathogenicity Islands (PAI) which are responsible for emergence of new pathogens are part of:
    (a) Integral part of integrons (b) Core genome of bacteria
    (c) Part of plasmids (d) Flexible genome pool of bacteria
22. Universal primers used in Sanger's sequencing of plasmid DNA are:
    (a) primers complementary to the vector sequences flanking the multiple cloning site
    (b) primers complementary to the antibiotic resistance gene of the vector
    (c) primers complementary to the multiple cloning sequence of the vector
    (d) primers of random sequence of length 18 nucleotides
23. In 2011, which virus was declared by OIE to be eradicated from earth after successful culmination of global vaccination and monitoring program for that virus?
    (a) Rinderpest virus (b) Sheeppox virus
    (c) Smallpox virus (d) Peste-des-petits ruminants virus
24. In the latent state, Herpes simplex virus makes an 8.3 kilobase RNA transcript called:
    (a) LMT or latent membrane transcript (b) None of the above
    (c) LAT or latency associated transcript (d) LANA or latency associated nuclear antigen

25. Variegation in four o'clock plants is an example of:
(a) Maternal effect (b) Nuclear inheritance
(c) Organelle heredity (d) None of the these

26. Tetracycline blocks protein synthesis by:
(a) Inhibiting translocase enzyme (b) Inhibiting peptidyl transferase
(c) Inhibiting binding of aminoacyl tRNA to ribosomes (d) Inhibiting initiation of translation

27. Winogradsky column is often used for the isolation of:
(a) Escherichia spp. (b) Pyrolobus spp.
(c) Desulfovibrio spp. (d) Sulfolobus spp.

28. What are the end products of Entner-Doudoroff pathway?
(a) Pyruvate (b) Acetaldehyde, pyruvate and CO_2
(c) Acetaldehyde and pyruvate (d) Ethanol and pyruvate

29. Flagella move the cell by:
(a) An individual flagellum beating in a whip-like motion
(b) Attaching to nearby particles and contracting
(c) Spinning like a propeller
(d) Many flagella beating in a synchronous whip-like motion

30. Use of microbes for the break down or removal of toxic wastes in water and soil is called as:
(a) Putrefaction (b) Recycling (c) Bioremediation (d) Decomposition

31. Leucine rich repeats (LRR) are an integral part of which immunological receptor?
(a) Dendritic cell receptor (b) Toll-like receptor (TLR)
(c) T cell receptor (TCR) (d) NK cell receptor

32. Chondroid of some bacteria are better known as:
(a) Bacterial plasmids (b) Bacterial plastids
(c) Bacterial mitochondria (d) Mesosomes

33. A condition in which a single mutation causes multiple phenotypic effects is:
(a) Multiphenotypy (b) Pleiotropy (c) Epigenesis (d) Epistasis

34. The blood samples of athletes can be tested for the presence of certain performance enhancing drugs using:
(a) Real time PCRs (b) Microarrays
(c) Mass spectrometry (d) Fluorescence spectroscopy

35. Cork screw shaped forms of bacteria are
(a) Stalked bacteria (b) Bacilli (c) Spirochaetes (d) Actinomycetes

36. How many molecules of carbon dioxide are released after five rounds of Krebs cycle?
(a) 18 (b) 12 (c) 10 (d) 6

37. The atomizer is used in the following process:
(a) Liquid-liquid extraction (b) None of the these
(c) Cross flow filtration (d) Spray drying

38. The process of nonreciprocal recombination by which one allele in a heterozygote is converted into the corresponding allele is called:
(a) Gene targeting (b) Gene knockout
(c) Gene amplification (d) Gene conversion

39. The process of RNA inactivation by siRNAs is termed as:
(a) RNA dysfunction (b) RNA silencing
(c) RNA interference (d) Short RNA inactivation

40. The production of high-fructose corn syrup (HFCS) from glucose involves which of the following enzymes?
(a) Hexokinase (b) Invertase
(c) Glucose isomerase (d) Glucose oxidase

41. This food-borne pathogen is very well known to grow even at refrigeration temperature:
(a) Salmonella enteritidis (b) Bacillus subtilis
(c) Listeria monocytogenes (d) Vibrio cholerae

42. The term ecosystem was coined by:
(a) Winogradsky (b) Pasteur (c) Flor (d) Tansley

43. In lactic acid fermentation the final electron acceptor is:
(a) Acetyl CoA (b) NAD^+ (c) Pyruvate (d) Glucose

44. Trickling filters are used in the following process
(a) Waste water treatment (b) Protein recovery from biomass
(c) Milk pasteurization (d) All of the these

45. The polio virus receptor which is an integral membrane protein is a member of immunoglobulin superfamily of proteins, and also is involved in establishment of intercellular junctions between epithelial cells:
(a) CD 55 (b) CD 51 (c) CD 15 (d) CD 155

46. Endotoxic shock produced by gram negative bacteremia is characterized by:
(a) Loss of large volumes of blood from host
(b) Extensive internal haemorrhage in the organs of the host
(c) Disseminated intravascular coagulation in the host
(d) Release of minimal amount of cytokines in the host

47. Interferon free direct acting antivirals (DAAs) therapy has revolutionized treatment for which virus infection in recent years?
(a) Human papilloma virus (b) Hepatitis C virus
(c) Chickenpox virus (d) Human Immunodeficiency virus

48. A transmembrane protein that mediates the adhesion of cells to the extracellular matrix is:
(a) Fibronectin (b) Laminin (c) Entactin (d) Integrin

49. Degranulation of most cells during hypersensitivity type I is known to produce:
(a) Histamine, serotonin and leukotrienes (b) Histamine alone
(c) Histamine, epinephrine and nor-epinephrine (d) Only Histamine and serotonin

50. Thiosulphate citrate bile salt sugar (TCBS) medium is used for selective isolation of:
(a) Non-cholera Vibrios only (b) Non-01 non-0139 Vibrio cholerae
(c) Most Vibrios (d) Mostly Vibrio parahemolyticus

51. Howard Walter Florey and Ernst Boris Chain were given the Nobel Prize for the process development of:
(a) Monoclonal antibodies (b) Penicillin
(c) Erythromycin (d) Glutamic acid

52. A type of cell adhesion molecule that recognizes oligosaccharides exposed on the cell surface:
(a) Exportins (b) Integrins (c) Laminins (d) Selectins

53. The method of post-transcriptional gene silencing is particularly useful in:
(a) Animals (b) Microbes (c) Plants (d) Insects

54. When B DNA is slightly dehydrated, it acquires:
(a) Z conformation (b) Positive supercoils
(c) A conformation (d) Negative supercoils

55. The Toll-like receptor (TLR) which is known to bind the lipopolysaccharide (LPS) of gram negative bacteria:
(a) TLR-4 (b) TLR-2 (c) TLR-1 (d) TLR-10

56. Which of the following skin disinfectant(s) is/are used frequently?
(a) Isopropyl alcohol (b) Ethyl alcohol
(c) Both of the above (d) None of the these

57. Which of the following statements is not true?
(a) Linkers are often used as cloning aids when making cDNA libraries
(b) cDNA libraries made in lambda phage vectors are screened by colony hybridization.
(c) To obtain single stranded DNA of a target sequence we clone the sequence into a phagemid
(d) When cloning large genomic contigs into YACs we may get chimeric inserts

58. Which of the following has beads on a string structure?
(a) Chromatin (b) Chromosomes (c) Heterochromatin (d) Nucleosomes

59. Which of the following is NOT a feature of eukaryotic gene expression?
(a) Multiple copies of nuclear genes and pseudogenes can occur
(b) RNA synthesis and protein synthesis are coupled
(c) Many genes are interrupted by noncoding DNA sequences
(d) Polycistronic mRNAs are very rare

60. Which of the following is the best explanation of lock and key theory of enzyme action?
(a) Enzyme determines the direction of reaction
(b) Enzyme interacts with substrate and lowers activation energy of the reaction
(c) Enzyme speeds up reaction as it comes in contact with reactants
(d) Compounds similar in structure to substrate inhibit enzyme activity

61. Which of the following is not an A-B type of toxin?
(a) Diphtheria toxin (b) Tetanus toxin (c) Pertussis toxin (d) Cholera toxin

62. Which of the following methods are used for enzyme immobilization?
(a) All of the these (b) Covalent binding (c) Adsorption (d) Affinity binding

63. Which of the following is responsible for unusual resistance of bacterial spores to heat?
(a) Polylysine (b) Dipicolinic acid (c) Mycolic acid (d) NAM-NAG

64. Which of the following is not true of RNA synthesis (transcription)?
(a) In transcription, U is inserted opposite T
(b) RNA polymerase needs a primer to initiate transcription
(c) New nucleotides are added on to the 3' OH of the ribose sugar
(d) RNA synthesis is always in the 5' - 3' direction.

65. Pathogen associated molecular patterns (PAMP) are detected by:
(a) B cell receptors (b) Non-leucine rich receptors
(c) Toll-like receptors (d) T cell receptors

66. Examples of epimers are:

(a) Both a and c (b) Glucose and galactose

(c) Glucose and mannose (d) Glucose and fructose

67. In 1961, Tim Loeb and Norton Zinder discovered these as the result of their search for phages whose replication depends on E. coli F-pili which is used for bacterial conjugation

(a) Bacteriophage Lambda (b) Bacteriophage T7

(c) RNA coliphage (d) PhiX174

68. The most abundant type of RNA in the cells is:

(a) rRNA (b) tRNA (c) mRNA (d) hnRNA

69. Expression of which of the early genes of Lambda phage leads to the replication of its DNA?

(a) O and P (b) P and Q (c) O, P and Q (d) O and Q

70. The 3, 5-Dinitrosalicylic acid is used for the estimation of:

(a) Phenols (b) Amino acids (c) Starch (d) Reducing sugars

71. You have isolated glucose oxidase which catalyses glucose oxidation and exhibits 50% Vmax at 0.05 M glucose. If you want to increase the reaction rate to 90% then what concentration of glucose you should use in the reaction?

(a) 1M (b) 0.45 M (c) 0.30 M (d) 0.40 M

72. Which of the following is not used in the pulping process of paper making?

(a) Kraft process (b) Chlorite treatment

(c) Bioleaching process (d) Sulfite process

73. Which among these kinds of viruses do not exist?

(a) Helical non-enveloped plant viruses (b) Helical enveloped animal viruses

(c) Helical non-enveloped animal viruses (d) Icosahedral plant viruses

74. Which one is not a subviral agent?

(a) Viroid (b) Virusoid (c) Prion (d) Mimivirus

75. Ames Test uses Salmonella typhimurium mutants to screen chemical agents that might be carcinogenic. The rationale behind this test is:

(a) DNA repair in bacteria is inefficient

(b) most carcinogenic agents are mutagenic

(c) the rate of spontaneous mutations in bacteria is much higher than in eukaryotes

(d) mutations in bacteria result in auxotrophy

76. Brandy is a distilled form of:

(a) Wine (b) Whisky (c) Beer (d) Vodka

77. A CSTR process where only feed rate is used to control the specific growth rate is called:

(a) Turbidostat (b) DOstat (c) Retentostat (d) Chemostat

78. An automated machine which is used for rapid (90 minutes) identification of Mycobacterium tuberculosis in the clinical sample:

(a) Gene Expert (b) BATAC (c) Vitek-2 (d) Microscan by Siemens

79. An antimicrobial agent which was a very common constituent of several toiletries but has recently been banned:

(a) Hexachlorophene (b) Ketoconazole (c) Iodine (d) Triclosan

80. An autosomal dominant disorder caused due to the expansion of trinucleotide repeats is
(a) Klinefelter syndrome
(b) Huntington disease
(c) Alzheimer disease
(d) Creutzfeldt-Jakob disease

81. Type II modification methylases methylate DNA at:
(a) Cytosine and guanine
(b) Adenine and thymine
(c) Cytosine and adenine
(d) Adenine and guanine

82. The nucleotides in RNA are joined by:
(a) 3'-5' phosphodiester bond
(b) 3'-3' phosphodiester bond
(c) 5'-3' phosphodiester bond
(d) 5'-5' phosphodiester bond

83. In prokaryotes, the first amino acid in the polypeptide chain is:
(a) Can be any amino acid
(b) N-methyl methionine
(c) Methionine
(d) N-formyl methionine

84. You were asked to electrophorese a sample of hyper-immune serum using agarose gel electrophoresis at pH-8.6. Which would be the fastest moving fraction?
(a) Fibrinogen (b) Albumin (c) β -globulin (d) γ -globulin

85. To identify the promoter motif to which a transcription factor binds we can use:
(a) DNA sequencing
(b) DNA footprinting
(c) DNA barcoding
(d) DNA fingerprinting

86. Iodine used in Gram-staining serves as a:
(a) Catalyst (b) Chelator (c) Mordant (d) Co-factor

87. Long acting thyroid stimulating (LATS) molecule are:
(a) Antibodies to thyroid stimulating hormone (TSH)
(b) Antibodies to thyroxine
(c) Antibodies to TSH receptors
(d) Antibodies to triidothyronine

88. In genetic engineering, in vitro packaging is used for:
(a) cloning a gene of size 2-4 kb into a plasmid and then incubating with packaging extracts to transform bacteria
(b) cloning large genomic contigs into BACs and then incubating with packaging extracts to transform bacteria with the BAC clones.
(c) Incorporating recombinant DNA into infectious bacteriophage particles.
(d) Translating proteins using rabbit reticulocyte lysates.

89. In a bioreactor, impellers increase the surface area of:
(a) Substrates (b) Cells (c) All of the these (d) Air bubbles

90. Which one of these is not an obligatory intracellular parasite?
(a) Rickettsia rickettsii
(b) Chlamydia suis
(c) Rhodococcus equi
(d) Mycobacterium leprae

91. Which of these is a cancer associated virus belonging to gammaherpesvirus subfamily of Herpesviridae family?
(a) Human herpesvirus 3
(b) Human herpesvirus 1
(c) Human herpesvirus 2
(d) Human herpesvirus 4

92. Which of the following is true of the genus Rickettsia?
(a) All of the these
(b) They are evolutionary similar to chloroplast
(c) They primarily use glycolysis for oxidation of glucose
(d) They are all parasitic or mutualistic

93. Which of the following indicates that pK of an acid is numerically equal to pH of the solution when the molar concentration of acid and its conjugate base are equal?
(a) Michaelis-Menten equation (b) Hardy Weinberg law
(c) Henderson-Hasselbalch equation (d) Haldanes equation

94. Which of the following methods is used for microbial cell disruption?
(a) Solid Shear method (b) All of the these
(c) Freeze-thawing methods (d) Liquid shear Method

95. Which of the following is not a cause of food poisoning?
(a) Clostridium perfringens (b) Salmonella typhi
(c) Bacillus cereus (d) Staphylococcus aureus

96. Which of the following bacteria is called the super bug that could clean up oil spills?
(a) Bacillus denitrificans (b) Pseudomonas putida
(c) Pseudomonas aeruginosa (d) Thiobacillus denitrificans

97. Which is not true of archaebacteria?
(a) Archaebacterial cell wall is made up of N-acetyl glucosamine and N-acetyl muramic acid
(b) Archaebacterial cell wall is rich in ether lipids
(c) Archaebacteria are insensitive to all major antibiotics
(d) None of the these

98. Knallgas-bacteria are bacteria that oxidize
(a) Sulphur (b) Nitrogen (c) Hydrogen (d) Iron

99. γ / δ T lymphocytes are located:
(a) in thymus (b) in gut associated lymphatic tissue (GALT)
(c) mainly in bone marrow (d) in spleen

100. The nonreciprocal interaction between non-allelic genes such that one gene influences the expression of another gene, leading to a specific phenotype, is called:
(a) Interference (b) Coincidence (c) Dominance (d) Epistasis